April 7, 1999

The Honorable Bill Richardson
Secretary of Energy
U.S. Department of Energy
1000 Independence Avenue
Washington, D.C. 20585

Dear Secretary Richardson:

The Department of Energy has asked NERAC to provide advice concerning the future of the Fast Flux Test Facility (FFTF) located in Richland, Washington. This task was assigned to a NERAC subcommittee charged with examining and providing recommendations concerning the DOE Nuclear Science and Technology Infrastructure Roadmap. After consideration of this matter, which included briefings by DOE personnel, site visits, and hearings, the NERAC Roadmap Subcommittee concluded that while the FFTF has unique capabilities, the Department must identify firm missions before it commits funds to restart this facility. The Subcommittee simultaneously provided similar recommendations regarding the future of the TREAT facility in Idaho.

Regarding the TREAT facility, the NERAC Roadmap Subcommittee believed that the possible missions and minimal operational costs associated with TREAT would likely support an eventual restart decision. However, they recommended that the Department first complete work on the Roadmap in order to identify firm missions for the facility prior to committing to its restart.

The Subcommittee's consideration of the FFTF was more complex. Restart and operation of the FFTF would involve significant costs. Further, DOE has not committed to any specific missions for the facility. The Subcommittee, therefore, recommends that DOE use the EIS process to firmly identify and evaluate possible missions and other key issues surrounding the restart and operation of the FFTF.

The complete NERAC Roadmap Subcommittee report containing recommendations concerning both FFTF and TREAT as well as the general infrastructure roadmap process accompanies this letter.

The NERAC Subcommittee report and recommendations were received and discussed by the full NERAC on March 31, 1999. While the members of NERAC accepted and endorsed the recommendations concerning the technology infrastructure roadmap process and the TREAT facility, they were divided on the recommendation of using the EIS process to reach a decision on the future of FFTF. Of the members present:

- 11 voted to accept the subcommittee report;
- 8 voted to express the opinion that the NERAC had insufficient information to render an

informed judgement; and

- 1 registered a strong opinion that the FFTF should be permanently shut down immediately.

As can be seen from this spread of votes, the NERAC was unable to reach a clear consensus on the question of FFTF's future. Because of the complexity of this issue and the diversity of views, NERAC believes it important to convey, along with the NERAC Roadmap Subcommittee recommendations, a sense of the more general concerns of its membership:

- First, there is no support among NERAC members for the status quo. The costs of continuing the reactor's standby status are simply too high to delay a decision. NERAC believes that a decision must be reached as rapidly as possible either to dismantle FFTF or to begin the process toward restarting the facility.

- Several NERAC members felt that DOE should have a well-defined set of missions for FFTF before conducting an EIS. The NERAC Roadmap Subcommittee felt that there were as many policy issues as technical issues to be addressed and the EIS process was the best way to cover all these issues at the same time and that it would enable a Record of Decision (ROD) on FFTF restart or dismantlement to be made more quickly.

- There was also considerable skepticism on the part of some NERAC members that a sufficiently compelling and unique array of missions can be identified to justify a restart. Indeed, there was at least one NERAC member who believed that there already exists adequate information to conclude that DOE should make an immediate decision to close the facility.

- There was significant concern expressed by most NERAC members about the costs associated with maintaining FFTF in a standby condition during the time it would take for an EIS process. Some believe that it should be possible to conduct a more focused and timely study rather than the more extensive EIS to determine whether there were sufficient missions to justify further consideration of a restart of the facility. Others, including the NERAC Roadmap Subcommittee, believe that the open and thorough nature of the EIS is the more preferable course toward obtaining the information necessary for a final decision.

In summary, NERAC believes that the options facing DOE are as follows:

1. To launch a process, using either an EIS or a less time-consuming study, to determine whether sufficient missions exist to justify the restart of the FFTF.

2. To conclude that sufficiently compelling and unique missions have been identified to begin the EIS process leading toward ROD and eventual restart of the facility.

3. To conclude based on existing information that there are not sufficiently compelling and unique missions to justify the costs of restart and operation of FFTF and that the reactor should be dismantled.

While most members support this first option, the NERAC believes that the Department must

remain conscious of the costs involved in a prolonged decision-making process. In any event, NERAC does not believe that the status quo of continued maintenance in a standby mode is a viable option.

We hope that these comments will be helpful in your decision.

Sincerely,

James J. Duderstadt, Chair
President Emeritus and University
Professor of Science and Engineering

Enclosure

DRAFT – VERSION 1.2

Report of the Roadmap Subcommittee

Nuclear Energy Research Advisory Committee

March 1999

Introduction

A subcommittee of the Nuclear Energy Research Advisory Committee (NERAC) has been formed to examine the DOE-NE Roadmap activities. The specific charge to this subcommittee is to lead NERAC's efforts to respond to the request of Mr. Magwood, Director, DOE-NE, that NERAC examine the current DOE Nuclear Science & Technology Infrastructure Roadmap in its predecisional draft form and to help create a new roadmap. The initial focus of this NERAC Subcommittee is to determine if the current roadmap is accurate and appropriate, provide recommendations for improvement, and identify specific action items. The charge letter from Mr. William Magwood to Dr. James Duderstadt, NERAC Chair, requesting these actions is shown in Appendix A. In addition, Mr. Magwood requested that the Roadmap Subcommittee provide preliminary recommendations to the full NERAC about potential missions for the TREAT and FFTF reactor facilities if they were restarted. Members of the NERAC Roadmap Subcommittee are:

Dr. Jose Luis M. Cortez	Dr. Miguel Rios, Jr.
Dr. Dale E. Klein (Chair)	Dr. Allen L. Sessoms
Dr. Warren F. Miller, Jr.	Dr. Charles E. Till
Dr. Joy L. Rempe	

The Roadmap Subcommittee met Jan. 26-27, 1999, in Washington, DC to hear DOE present their current roadmap. On Feb. 18-19, 1999, the subcommittee toured DOE facilities in Idaho and Washington.

Background

The Department of Energy's Roadmap exercise currently examines three types of facilities: hot cells, reactors, and accelerators. Five technical areas were examined: space missions, medical isotopes, nuclear power, general sciences, and national security. DOE's Roadmap process examines the infrastructure and science and technology needs through the year 2020. These needs are not only for the Office of Nuclear Energy, Science and Technology but for DOE in general. The following are the subcommittee's comments and observations followed by recommendations and conclusions. It should be noted that these comments are based on the subcommittee's activities to date. It is anticipated that these observations, comments, and recommendations will evolve as the subcommittee obtains additional information.

Comments on the Roadmap Process

The DOE should be commended for undertaking this roadmap exercise. It is extremely important that DOE address its facility and other resource needs in a systematic fashion rather than each office looking after its own needs. DOE indicated that the current predecisional draft, which concentrates on facilities and programmatic areas, is simply the first phase. As noted in Mr. Magwood's charge, the second phase should also examine personnel needs and include a broader set of stakeholders. The gap analysis defined short-term needs as required now, mid-term needs as required in 5-7 years, and long-term needs as required in 10-20 years. The basis for looking at the needs for the three infrastructure areas—hot cells, reactors, and accelerators—resulted from DOE's initial examination of its reactor needs and evolved into addressing related facilities. For the first phase of the roadmap, DOE did not consider budget

constraints in evaluating perceived needs. The following are the subcommittee's comments and observations on the general roadmap process (not presented in any order of importance). It should be emphasized that this is a good time for NERAC feedback to DOE since the roadmap is still in predecisional draft form.

1. The roadmap process for DOE is very complex due to the large scope of activities in which DOE is involved.

2. The first phase included identifying facilities, but more detail is needed. For example, there is a need to provide a true status of the hot cells such as availability and depth of crews. Can some standby units be made available for other purposes? Are supporting facilities available? The level of detail for the hot cells should be expanded to include the uniqueness of facilities and which are currently licensed to handle specific materials. Also, additional information on non-DOE reactors–especially university research reactors—would be useful.

3. Higher level of involvement at DOE and at the national laboratories as this draft is refined is recommended. This includes addressing policy issues and priorities.

4. It is recognized that the roadmap is in its early stages, but the issue of personnel needs is likely to be equally important as facility needs.

5. In examining the nuclear science activities, input and planned funding at other federal agencies should be examined. These would include agencies such as NIST, NSF, DOD, NRC, NASA, etc. In addition, higher education should also be involved. In the area of medical isotopes, activities at NIH should be examined. The roadmap

should have input from these other areas; otherwise, it will only be an internal document without great depth of analysis.

6. Although the roadmap was developed to identify facilities needed by programs, it should also be applied to determine which facilities are no longer needed.

Facilities

Comments on Hot Cells

To address this topic, the subcommittee reviewed the information in the "Nuclear Science and Technology Infrastructure Roadmap Predecisional Draft," Appendix D, "Report of the Hot Cell Infrastructure Capabilities Team," and the presentation, "Hot Cell Facilities Survey," by Gordon Michaels, ORNL, Leader of the Hot Cell Infrastructure Capabilities Team. Our subcommittee believes that the hot cell information could be improved by the following actions:

1. Additional review and input by appropriate laboratory, university, and industry personnel is needed. It is important to include DOE-EM in these discussions because they are significant users of hot cell facilities. It was observed that inaccuracies and inconsistencies existed in the information about several hot cells (e.g., INEEL hot cell descriptions were incomplete and varied in each reference reviewed). It is suggested that these inconsistencies could be corrected if the Predecisional Draft and Appendix D received appropriate review.

2. Additional information to distinguish the hot cells is needed. Specifically, the committee recommended that the hot cell description tables be expanded to include the following information:
   - Operational Viability – Descriptions should evaluate if sufficient personnel and

equipment are available for the facility to support various activities. Also, some indication about the likelihood of the facility's continued operation would be useful.

- Facility capabilities – Descriptions should discuss capabilities, such as the size of specimens it is capable of examining (e.g., can it handle full-sized fuel assemblies), if the facility has Pu capabilities, and if it can perform aqueous processing.
- Location-related missions – Descriptions should note if the facility's primary function is to support other nearby facilities (e.g., a reactor).
- Percent Utilization – Descriptions should note how much the facility is utilized and identify major programs and customers.
- Licensing status – Descriptions should provide some indication about the ability of the facility to comply with current DOE safety and licensing requirements.

6. Expanded scope is needed. Additional stakeholders should participate in this process so that more information about industry, university, and international hot cells is included. This additional information should be grouped according to major users (e.g., Plant Operators, Regulators, Industry-sponsored Research Organizations, Universities, International Users, etc.). In addition, it is recommended that some sort of prioritization be performed within each major user group so that it is easier to discern which equipment capabilities are most needed. Information about the non-DOE hot cells should be included in the main report.

Comments on Reactors

To address this topic, the subcommittee reviewed the information in the "Nuclear Science and Technology Infrastructure Roadmap Predecisional Draft," Appendix C, "Report of the

Reactor Infrastructure Capabilities Team," and the presentation, "U.S. Research Reactors," by Paul Pickard, SNL, Leader of the Reactor Infrastructure Capabilities Team. Our subcommittee believes that the reactor information could be improved by the following actions:

1. Additional review and input is needed regarding non-DOE facilities. Data on university and other non-DOE facilities was either weak or missing.

2. A more systematic evaluation of the existing DOE facilities would strengthen the document. Some facilities are heavily utilized while other facilities have unused capacity. For example, fifty percent of the irradiation locations in the Advanced Test Reactor (ATR) are typically unused when the reactor is operating. Another example is whether the Annular Core Research Reactor (ACRR) should be used for isotope production and the Transient Research Test Facility (TREAT) be used for pulsing studies.

3. A more systematic evaluation of reactor charging practices is needed. For example, users may be charged to perform an experiment at a non-DOE reactor (like the University of Missouri Research Reactor), whereas there may be no charges for reactor time at a DOE facility.

4. A more detailed assessment of the types of reactors needed by DOE should be provided. For example, the High Flux Beam Reactor (HFBR) was primarily designed for scattering experiments with several beam ports, the High Flux Isotope Reactor (HFIR) has a high flux trap, the ATR has several in core and reflector tubes, and the Fast Flux Test Facility (FFTF) was designed to support the fast reactor program. It is important to match each research reactor’s capabilities with research needs or isotope

production requirements.

5. An assessment of the personnel to operate DOE's reactors is needed. In addition, the universities that operate research reactors represent a resource, but their personnel needs, maintenance, and upgrades should also be addressed.

As noted at the beginning of this report, the Subcommittee was also asked to provide preliminary recommendations about possible missions for the TREAT and FFTF reactors if DOE decides to go forward with the restart of these reactor facilities. As noted at the beginning of this report, several NERAC subcommittee members traveled to the TREAT facility (ANL-W) and to the FFTF facility (PNNL) in order to obtain additional information about these facilities. Several documents describing these reactors and possible missions for these reactors were made available to the subcommittee. Insights gained about these facilities are summarized below as well as some general comments on ATR:

TREAT

The TREAT tour demonstrated that the facility has been well maintained. DOE-NE currently spends approximately $1 M per year to maintain TREAT in a standby condition. Sufficient fuel is stored on site for the lifetime of the TREAT reactor. ANL-W estimates that, depending on program requirements, it will cost from $2.8 to $3.8 M to operate the TREAT facility. No community stakeholder organizations have expressed any concerns about restarting TREAT.

Possible missions identified by ANL-W for the TREAT facility include transient fuel testing for commercial LWR and CANDU reactors, transient testing for DOE Defense Programs, support for the nation's Boron Neutron Capture Therapy program, and support for defense related programs. The ANL-W presentations and informal discussions with ANL-W indicate

that none of these programs have expressed a clear interest in using TREAT. For example, it appears that DOE-DP's interest in TREAT has waned because of delays in ACRR's transition to Mo-99 production.

Our subcommittee believes that the TREAT reactor possesses unique capabilities that DOE should preserve. However, we also recommend that DOE-NE identify several firm missions for the TREAT facility before it commits funding toward restart activities for the reactor. Consultation with organizations outside DOE should be examined, such as the NRC, EPRI, and possibly the Canadian government.

ATR

ATR is a unique test reactor that provides considerable irradiation services. This facility is well maintained and heavily (but not fully) utilized. Because the ATR's base program is funded by the United States Naval Reactors Program, it has a positive future with test plans for the next several years. Although this facility is primarily reserved for the Navy, the ATR can provide a broad range of support for materials research and for isotope production. In addition, the ATR might be useful in the training of nuclear reactor personnel at other sites. The ATR can provide unique cost sharing arrangements for other users due to its solid base funding.

One concern expressed by ATR staff was inadequate funding to maintain more than minimal staffing requirements.

FFTF

The FFTF tour demonstrated that this facility is also well maintained. Configuration control

was used extensively as the facility was placed in a standby condition so that it could be restarted if necessary. During FY99, FFTF will receive $40 M per year from DOE-NE to maintain the reactor in a standby condition. The staff estimates that it would cost at least $55 M per year for the facility to be fully operational. This estimate assumes that the reactor only uses two loops and operates at a power level of 100 MW_{th} (instead of its total 400 MW_{th} power level). It was observed that the currently available fuel for this reactor would last approximately six years if the reactor were run at this lower power level. The staff indicated that they had conducted preliminary inquiries into several options available for obtaining additional fuel, including the use of a commercial vendor, LANL, and producing it on-site (as originally planned). The staff estimates that new fuel will cost approximately $6 M per year.

Potential missions that the FFTF staff identified for this facility include Pu-238 and medical isotope production. It was also noted that other possible missions included support work for the Japanese IFR program, material hardening for electrical components, space missions research, and DOE-DP R&D needs (other than tritium production). It appears that funding from other possible missions will not initially cover estimated FFTF operational costs. There is some strong public opposition to FFTF restart.

Clearly, the FFTF reactor possesses unique capabilities. However, our subcommittee believes that DOE-NE must identify several firm FFTF missions before it commits funding toward restart activities for this reactor.

Comments on Accelerators

To address this topic, the subcommittee reviewed the information in the "Nuclear Science and Technology Infrastructure Roadmap Predecisional Draft," Appendix E, "Report of the Accelerator Infrastructure Capabilities Team," and the presentation, "Accelerator Team Report,"

by Bob Bari, BNL, Leader of the Accelerator Infrastructure Capabilities Team. Our subcommittee believes that the accelerator information could be improved by the following actions:

1. A comprehensive case-by-case review of existing accelerators is needed. Based on the table of interest to DOE (last page of Appendix E), it appears that there could be redundancy and obsolescence issues. This suggests that a group of knowledgeable, practicing physicists should examine this table and recommend the closures where there exists obsolete/redundant capacity and upgrades in order to maintain a lean but very efficient and well-supported infrastructure of accelerators.

2. A better-defined science need is recommended. An examination of accelerator needs should consider the accelerator and the area of needs for research on targets. Other science areas should be defined, such as the need for proton radiography and medical isotope production.

3. An examination of the need for future large-scale accelerators should be performed. Although SNS is a part of DOE's Roadmap, this facility is costly and should be a major part of DOE's assessment of all its accelerator needs.

4. Systematic integration of DOE accelerator programs is needed. Two large research areas seem to oscillate in importance over time: accelerator transmutation of wastes and tritium production. DOE should develop a long-range plan for these and other large accelerator based programs so that it can conduct a logically consistent program.

Nuclear Science Needs

Comments on Space Mission

To address this topic, the subcommittee reviewed the information in the "Nuclear Science and Technology Infrastructure Roadmap Predecisional Draft," Appendix G, "Report of the Space Mission Needs Identification Team," and the presentation, "Space Mission Team Report," by Colette Brown, DOE-NE, Leader of the Space Mission Needs Identification Team. Our subcommittee believes that the space mission information could be improved by the following actions:

1. Identification of the amounts and types of isotopes needed for the space program should be provided. It is clear that DOE should continue supporting the present and future application of nuclear technology for space exploration. The production of Pu-238 is a classic example where requirements for Pu-238 production and processing should be quantified as accurately as possible. For example, decisions about facilities required to meet space power needs differ if Pu-238 requirements are below or above the maximum processing capabilities of the ORNL Radiochemical Engineering Development Center (5 kg/yr).

2. Better identification of research needs would be helpful. There are two clear cases where nuclear technology can be used for space applications: space power and testing of components to be used in space. The possible needs for nuclear power reactors in space should be further refined. In addition, the need for testing of components that will be used in space should be defined. This is especially important if the testing of components in space needs a fast flux spectrum. This need should be determined before a decision to dismantle the FFTF is made.

Comments on Medical Isotopes

To address this topic, the subcommittee reviewed the information in the "Nuclear Science and Technology Infrastructure Roadmap Predecisional Draft," Appendix F, "Report of the Isotopes Needs Identification Team," the presentation, "Medical Isotopes Team Report," by John Pantaleo, DOE-NE, Leader of the Isotopes Needs Identification Team, and the report, "Expert Panel: Forecast Future Demand for Medical Isotopes," that was prepared by the DOE-NE Expert Panel on Isotope Production. Our subcommittee believes that the medical isotope information could be improved by the following actions:

1. A comprehensive study of the use and research needs of medical isotopes is required. This is an extremely important area and impacts other areas of DOE such as the number and type of accelerators and nuclear reactors to develop new isotopes and to manufacture these isotopes once their use is implemented. This area of development should be coordinated with other federal agencies such as NIH.

2. A comprehensive study of the facilities needed to meet the demand for medical isotopes is required. This area overlaps the previous section on facilities, but it is imperative that facilities exist for medical isotope development and production. Both DOE and non-DOE facilities should be examined.

3. An examination of "who pays" should be performed. It is important to look at the charges involved in isotope research. Some DOE facilities absorb the charges for reactor/accelerator time, whereas non-DOE facilities must typically charge for any services provided.

Comments on Nuclear Power

To address this need, the subcommittee reviewed the information in the "Nuclear Science and Technology Infrastructure Roadmap Predecisional Draft," Appendix H, "Report of the Nuclear Power Technology Needs Identification Team," and the presentation, "Nuclear Power Technology Roadmap Team Report," by John Herzeg, DOE-NE, Nuclear Power Technology Needs Identification Team Leader. As noted by Mr. Herzeg, it is difficult to define the needs of an undefined research program. Hence, the Nuclear Power Technology Team first defined a vision for the Nuclear Power Technology area based on several recent reports and symposiums held by major stakeholders in the nuclear power technology area. Using this vision, the Team then identified all possible programs to support their vision and the facilities needed to support these possible programs. Risks and responsibilities associated with Mr. Herzeg's approach are discussed below with recommendations to reduce some of these risks.

1. A major risk is that a facility need may be missed if a new research program is identified that was not included in their program plan. Likewise, there is a responsibility to update this roadmap regularly–eliminating programs that no longer seem viable and adding new programs that appear on the horizon. To obtain useful insights from the compendium of needs compiled by the Nuclear Power Technology Team, it is suggested that priorities be established. Recognizing that it is difficult to determine at this time which type of research has higher priority, it is suggested that this prioritization could be done by determining if a limited set of facilities exists that could best meet most potential research needs. In addition, it is recommended that additional stakeholders be added to this process—to obtain additional support for their defined vision and to determine if there are other non-DOE domestic and international research programs and facilities that impact the needs identified in the current document.

2. As in other roadmapping activities, it is recommended that this process be expanded to consider personnel requirements associated with potential research programs.

Comments on General Sciences

To address this topic, the subcommittee reviewed the information in the "Nuclear Science and Technology Infrastructure Roadmap Predecisional Draft," Appendix I, "Report of the General Science Needs Identification Team," and the presentation, "General Nuclear Science Team Report," by Norton Haberman, DOE-NE, Leader of the General Sciences Infrastructure Capabilities Team. Our subcommittee believes that the general sciences information could be improved by emphasizing the following information:

1. Outline DOE's approach for ensuring adequate sources of neutrons over the next 20 years.

2. Data that illustrate current sources in the U.S. are oversubscribed by about a factor of three.

3. Data that illustrate that neutron sources in Europe, especially within the OECD countries, are facing similar constraints.

4. The necessity of upgrades to certain reactor facilities, such as HFBR and HFIR, are essential if U.S. science is to remain at the cutting edge in a broad range of general sciences. It is projected that about two-thirds of the currently available neutron sources within the OECD countries (including the U.S.) will shut down by 2020. Therefore, upgrades to these facilities are essential to science areas, such as radiation effects studies, neutron activation work and the creation of new neutron capture

therapies for medical purposes. Programmatic, budgeting, and personnel plans to carry out these tasks should be determined.

5. Programmatic plans for maintaining other facilities such as the Oak Ridge Electron Linear Accelerator (ORELA) and the Los Alamos Neutron Science Center (LANSCE), and the development of new, accelerator based, neutron sources for medical and research uses should be developed.

6. The full implementation of the Spallation Neutron Source (SNS), including proposed future upgrades, must be integrated into the general science program at DOE. This includes an assessment of the associated budgetary impacts.

7. Collaboration in the construction of future neutron sources, such as the proposed International Fusion Materials Irradiation Facility (IFMIF), at a cost of $800 million, must be addressed as part of U.S. plans if we are to remain at the forefront of neutron research. Therefore, a plan should be developed to encourage collaboration and the associated budgetary impacts be addressed.

Comments on National Security

To address this topic, the subcommittee reviewed the information in the "Nuclear Science and Technology Infrastructure Roadmap Predecisional Draft," Appendix J, "Report of the National Security Needs Identification Team," and the presentation, "National Security Team Report," by Anthony Peratt, DOE-DP, Leader of the National Security Needs Identification Team. The national security presentation was limited because the briefing was conducted in a non-secure area and because the briefing included individuals that did not have security clearances. A small group of the Roadmap Subcommittee will have a more detailed presentation in the future. Obviously, the national security portion of DOE's budget is significant. Therefore, a successful DOE roadmap must include the national security needs in an integrated manner.

Recommendations

There are numerous comments and recommendations throughout this report. Three specific major recommendations will be made here: Continue the roadmap process, define missions to evaluate the restart of TREAT, and perform an EIS to determine if the FFTF should be restarted or dismantled.

1) Continue the roadmap process with the following actions:
    a) Enhanced integration of the roadmap within DOE. Rather than consulting with each DOE office, their participation should be thorough and comprehensive.
    b) Expand roadmap participation to include other technical groups such as EPRI, NEI, NSF, higher education, NIST, NIH, etc., so that this is not just an internal DOE document.
    c) Ensure that there is high level DOE policy input and that budgetary impacts are addressed.
    d) Priority rankings should be provided so the roadmap can be implemented in the most effective manner.
    e) Personnel needs should be addressed. This includes both depth and technical needs.
    f) Involve the NERAC in the roadmap activities.

2) Develop clear long term missions for TREAT in evaluating the restart of this unique reactor facility.

3) Conduct an EIS for the restart of FFTF. Issues the EIS should address include, but are not limited to, the following:
    a) Define specific missions for FFTF (Note: It is unlikely that there will be a

single mission that could justify the restart of FFTF other than some national security needs).

b) Address where the supporting missions would occur if FFTF is restarted (e.g., chemical processing for medical isotopes or for Pu-238).

c) Justify the cost for operating this existing facility. (Note: Based on the subcommittee's review of DOE needs, FFTF is not the type of reactor that DOE would build today for a multi-mission facility. However, this reactor does exist and it does have unique characteristics. Hence, there are tradeoffs that must be considered with respect to the facility's high cost of operation versus the low probability of DOE being able to build a new reactor. (NOTE: Costs will likely be addressed at the Record of Decision (ROD) stage, not the EIS stage, but numbers can be developed as the EIS progresses.)

d) Specific collaboration with other countries should be well defined.

e) A feasible plan of obtaining additional FFTF fuel should be developed.

f) Determine the location where radioactive wastes generated from FFTF operation would be disposed.

g) Determine the possibility of FMEF being used for any supporting mission if FFTF is restarted.

h) Determine the cost to restart and to modify FFTF for other missions. (NOTE: Costs will likely be addressed at the ROD stage, not the EIS stage.)

i) Determine the role FFTF might fill for DOE-DP R&D needs based on no underground testing.

<u>Conclusions</u>

DOE should be commended for developing a roadmap that addresses known and perceived needs through the year 2020. The opportunity for the NERAC subcommittee to comment on the roadmap is timely since it is still in predecisional draft form. During the next phase, it would be advantageous to have greater NERAC participation.

The most difficult decision the subcommittee was asked to address involved the FFTF. Secretary Richardson has determined that the FFTF will not be used to produce tritium and is looking for guidance from NERAC on what should be done with FFTF—restart or dismantle. As the subcommittee made its deliberations, we came down to two options. The first was to define a series of issues that should be addressed before DOE would decide to perform an EIS for the restart of FFTF. The other option was to define a series of issues to be addressed during an EIS.

The FFTF is a unique facility that has the ability to perform certain research studies that cannot be performed in any other U.S. nuclear reactor. FFTF was designed to meet a mission that no longer exists today, it is a reactor that has limited flexibility (e.g., cannot add beam tubes for neutron scattering research), it has high operating costs, and it is not the type of reactor that would be built today. However, it does exist, and it has been maintained in excellent condition during its shutdown period.

The FFTF has proponents and opponents. Therefore, the subcommittee believes that the best way to evaluate the restart of FFTF is to conduct an honest, open assessment with full participation of the local community. The EIS process enables such an assessment where all the issues can be addressed (with the exception of some specific national security issues) and will provide information so that Secretary Richardson can make a fully informed decision on whether FFTF should be restarted or dismantled. The subcommittee does not recommend either the restart or the dismantlement of FFTF. We recommend that an EIS be performed to address this

question.